

WHAT IS OZONE?



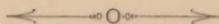


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[Reprint from *N. Y. Medical Tribune.*]

WHAT IS OZONE?



Ozone is an allotropic modification of oxygen, in like manner as the diamond, graphite, and charcoal, although displaying a striking difference in their several physical characteristics, are all merely allotropic conditions of the same element, namely carbon. Ozone, then, is merely oxygen, only in a different physical condition, being more condensed, and possessing much greater activity. It has a peculiar, penetrating odor, somewhat resembling that of chlorine, and perceptible in the atmosphere even when the ozone is present in the proportion of only one part in one million parts of atmospheric air. Ozone is the most energetic oxidizing agent known, and attacks even the nitrogen of the air—usually so different in its affinities—as well as most other elements, converting them into their highest forms of oxidation. When ozone is exposed to a temperature of 250° C. equal to 482° F., it is converted again into the condition of ordinary oxygen. It is produced in nature by electric discharges in the atmosphere, and is therefore more abundant in the neighborhood of strongly electrified cloud-masses, and in general, in the higher regions of the atmosphere. Through the agency of rain, and particularly of snow, as well as by the descent of condensed moisture, it is conveyed to the lower regions of the atmosphere. It is then rapidly decomposed by coming in contact with oxidizable substances of either vegetable or animal origin, on which it can exert its destructive effect.

Such bodies as carbonic oxide gas, sulphuretted and phosphuretted hydrogen are at once attacked, deprived of their gaseous form, and transformed into other combinations, which are then transferred to the earth. Air loaded with putrid or miasmatic exhalations is therefore immediately purified by contact with ozonized air, and again a development of such exhalations cannot well take place in the presence of ozone.

The action of ozone on such impure air is extremely powerful. According to Schoenbein, an atmosphere containing only 1-3,240,000 of ozone is capable of destroying all noxious matter contained in an equal volume of miasmatic air. Where or whenever there is a deficiency of this quantity of ozone, there will occur zymotic and contagious diseases, such as typhoid, scarlatina, measles, small-pox, miasmatic fevers, yellow fever, etc., as well as all sorts of skin diseases. To detect ozone in the atmosphere, a very satisfactory test is to expose to the air a moistened piece of test paper prepared as follows: The best Swedish filter paper cut in strips, is dipped in a solution of starch and potassic iodide, then

dried and preserved from the air and light. When it is to be used, it is slightly moistened (when too dry) by holding it against vapor, or breathing upon it, and then hanging it out in the air from two to ten feet from the ground, protected from the strong *sun* and *wind*. After six hours it will have been oxidized; then remove and dip it into distilled water, when a purple reaction will show in the paper. It is then compared with Dr. Lender's ozonometer, which gives the degree of ozone in the atmosphere where it had been placed. This paper indicates free ozone by liberation of iodine, and consequently, blueing of the starch.

The ozonometry in Boston, which has been carried on since 1878, has proved unsatisfactory, owing to the small quantity of ozone found, which the following table will show, and consequently, the increase of sickness amongst children.

It is acknowledged by the highest authorities of Europe, that the health of a community depends entirely on the quantity of ozone in the atmosphere. The measurement for ozone was conducted in the following manner. A test paper was exposed to the atmosphere mornings at 7 o'clock, remaining until 1 P.M., and from 1 P.M. to 7 P.M., six hours each. Another was exposed from 7 A.M. to 7 P.M., and from 7 P.M. to 7 A.M., also twelve hours. The result thus received showed maximum No. 6 in twelve hours on a 14 scale ozonometer, medium Nos. 4 and 5 in six hours, minimum Nos. 0 and 2 in the six hours in the day time. Measurements were taken at the same time with the same test papers on a farm, West Stockbridge, Birksheir County, situated on Pleasant Hill about 150 feet above the level of the sea, with much better result. Papers exposed from 7 A.M. to 1 P.M., and 1 P.M. to 7 P.M., show Nos. 8 and 9 on the meter at day time. Those exposed for twelve hours give during the day No. 10, during the night No. 8. In Boston during the hot, dry summer day, no ozone could be observed, while in a thick eastern fog a larger percentage could be observed.

